

Response After Final
Application No. 10/083,533
Attorney Docket No. 020244

REMARKS

Claims 1, 2, 3, 7, 9, 12 and 14 are pending. Claims 16-39 are withdrawn from consideration.

Request for Withdrawal of Finality of Office Action

The Office Action has been designated as final. Specifically, the Office Action states that the amendments necessitated the new grounds of rejection. See page 8, section 7. However, no amendments were entered in the last response of June 8, 2007. Only a priority document was filed to pre-date a cited reference. As such, applicants respectfully request withdrawal of the finality of the Office Action on the basis that no amendments were entered to necessitate the new rejection.

Applicants Response to the Claim Rejections under 35 U.S.C. §103(a):

Claims 1, 2-4, 7, 9, 10, 12 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chang et al. (US 6,004,829) in view of Fastow et al. (US 6,294,430). Applicants respectfully traverse on the basis that the combination does not teach each and every limitation of the claimed invention. Specifically, the combination of Chang and Fastow does not teach or result in a gate insulating film interposed between the substrate and the gate electrode having a uniform thickness at the region under the entire gate electrode.

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The Office action states that Chang teaches "...the gate insulating film GX2 is interposed between substrate 110 and the gate electrode GX2 have a uniform thickness at the region under the entire gate electrode GX2, fig.4H..." See page 3, section 3 of the current Office Action.

According to Chang, (i) after formation of a tunnel oxide film, a floating gate is formed and an ONO film is formed (see Fig. 4A); then, (ii) a gate oxide film for peripheral transistors is formed, and thereafter, gate polysilicon is formed (see Fig. 4B); (iii) then, the gate electrodes of the peripheral transistors are formed (see Fig. 4C); (iv) then, the stack gate electrode of an EPROM is formed (see Fig. 4D); and (v) an oxide film 15 is formed (See Fig. 4F). At this point, a bird's beak is formed in both the EPROM and the peripheral transistors.

Thus, although the Office Action relies on the gate electrode GX2 of Chang as disclosing a "gate insulating film" with a uniform thickness such as in the presently claimed invention, the gate electrode GX2 of Chang fails to "have a uniform thickness at the region under the entire gate electrode" because of the above-described process results in a bird's beak of the oxide film 15 beneath all the transistors T1-T3. As illustrated in Figs. 4E and 4F all the transistors are exposed when the oxide film 15 is formed.

On the other hand, according to the embodiment of the presently claimed invention, a bird's beak is formed in a flash cell by forming the gate electrode of the flash cell and then performing oxidation. See Fig. 9C and 9D. However, no oxidation is performed after formation of the gate electrode of a peripheral transistor. See Figs. 9E-9I. Accordingly, no bird's beak is formed in the peripheral transistor. Thus, the gate insulating film has a uniform thickness under

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the peripheral transistor. See Figs. 10A-10B. Since no bird's beak is formed in the peripheral transistor, the peripheral transistor has improved characteristics.

Thus, a combination of Chang and Fastow does not teach each and every limitation of the claimed invention. The process set forth in Chang results in a bird's beak formed in both the EPROM and the peripheral transistors because all the transistor gates have been formed prior to the oxide film 15 being formed, and all the gates are exposed during the oxide formation. See Figs. 4E and 4F. For at least the reason set forth above, applicants respectfully submit that claims 1, 2-4, 7, 9, 10, 12, 14, and 40 are not obvious in light of the combination of Chang and Fastow.

Claims 6 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chang and Fastow and further in view of Prall et al. Claims 8 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chang and Fastow and further in view of Applicant Admitted Prior Art. Claims 6, 8, 13 and 15 depend on independent claim 1 or 9. Accordingly, applicants respectfully submit that the rejection of the dependent claims is addressed by addressing the rejection of the parent claims as detailed above.

In view of the above remarks, Applicants submit that the claims, as previously presented, are in condition for allowance. Applicants request such action at an early date.

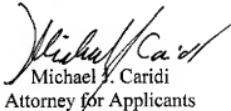
If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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